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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,179	06/27/2003	Larry Wayne Mobley	62674A	7650
109	7590	02/24/2006	EXAMINER	
THE DOW CHEMICAL COMPANY INTELLECTUAL PROPERTY SECTION P. O. BOX 1967 MIDLAND, MI 48641-1967			SELLMAN, CACHET I	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 02/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/609,179		MOBLEY ET AL.	
	Examiner		Art Unit	
	Cachet I. Sellman		1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) 28-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/12/2004, 4/21/2004, 9/17/2004, 1/24/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-27, drawn to a method for making synthetic leather, classified in class 427, subclass 337.
- II. Claims 28-43, drawn to a synthetic leather, classified in class 442, subclass 59.

The inventions are distinct, each from the other because of the following reasons:

1. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the fibers of the non-woven or woven textile used may comprise fibers impregnated prior to their incorporation into the textile rather impregnating them following the formation of said textile. This constitutes a materially different process to produce the article of Invention II.
2. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
3. During a telephone conversation with Kevin Nilsen on 1/24/2005 a provisional election was made with traverse to prosecute the invention of a method of making

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synthetic leather, claims 1-27. Affirmation of this election must be made by applicant in replying to this Office action. Claims 28-43 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

4. Claims 8-10 are objected to because of the following informalities: In claims 8-10 the applicant states "wherein the coagulant time" this seems to be a typographical error and should read "wherein the coagulation time." Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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1. Claims 1 and 12- 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Hoersch (US 2004/0253370A1).

2. Hoersch discloses a method for preparing synthetic leather that comprises the steps of impregnating a textile substrate that may be woven or non-woven [0047] with a polyurethane dispersion comprised of a nonionizable polyurethane and an external stabilizing surfactant [abstract, 0024, and 0031-32]; then exposing the impregnated textile to water containing a coagulant for a coagulation time sufficient to coagulate the dispersion [abstract, 0028, 0052] as required by **claim 1**. Hoersch further teaches that the polyurethane dispersion can contain a thickener such as methylcellulose ether, which is water-soluble, and not nonionizable [0033 and 0035] as required by **claims 12-14**.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoersch in view of Shikada (US 3772059).

The teachings of Hoersch as applied to claim 1 are as stated above.

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Hoersch does not teach leaching the impregnated textile after coagulating by exposing the impregnated textile to water as required by **claim 11**.

Shikada discloses a method for producing a microporous sheet material having excellent abrasion resistance and moisture-permeability that is useful for artificial leathers the process includes the steps of applying a coating solution to a base material (such as woven or nonwoven fabric (column 8, lines 22-25)) then coagulating the material in a coagulating bath that comprises an aqueous solution of an inorganic salt and is washed with water to leach out and thoroughly remove the inorganic salt and then the material is dried (abstract and column 8, lines 5-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Hoersch to include the step of leaching the material as taught by Shikada. One would have been motivated to do so because both Hoersch and Shikada teach processes for forming synthetic leather and Shikada further discloses that removing the salt from the material results in a material with excellent moisture-permeability therefore one would have a reasonable expectation of success in forming the synthetic leather with excellent moisture-permeability.

5. Claims 1, 2-5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek (US 4833173) in view of Kukkala et al. (US 5859111).

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Spek discloses a method for coagulating materials such as textile cloth by impregnating it into an impregnating bath containing a coagulable polymer latex and a heat-coagulant and a chemical or physical foaming agent, followed by coagulation.

Spek does not teach the use of a nonionizable polyurethane or the use of an externally stabilizing surfactant as required by **claim 1**.

Kukkala et al. discloses a process for preparing an aqueous polymeric dispersion which comprises the steps of using a nonionizable polyurethane (column 2, lines 24-30), dispersed in water with a dispersing aid such as a surfactant (column 2, lines 46-55 and column 3, lines 5-6). Kukkala teaches that the use of internal dispersing agents results in pH instability and reduced water and solvent resistant and that the use of the nonionizable polyurethane does not require an organic solvent which reduces cost because it eliminates the distilling step (column 1, lines 23-59). Kukkala et al. further discloses that the dispersion can be used to make synthetic leathers (column 11, lines 3-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek to include the polymeric dispersion taught by Kukkala et al. One would have been motivated to do so because Kukkala et al. teaches a polyurethane dispersion that can be used with textile substrates and for forming synthetic leathers that has pH stability, and good water and

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solvent resistance and does not require the use of an organic solvent which saves in production cost and Spek discloses a process for forming synthetic leather using a polyurethane dispersion therefore one would have a reasonable expectation of success in forming the synthetic leather which has good water resistance.

As mentioned above the process is performed in the absence of an organic solvent as required by **claims 2 and 3**. Spek further discloses that the coagulation takes place in a bath, which contains hot water and a salt of the alkali and earth alkaline metals (column 47-54) as required by **claims 4 and 5**. Spek discloses in an example where an impregnated cloth is immersed in a coagulating bath for 30 seconds (column 10, lines 39-42) as required by **claims 8-10**.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spek in view of Kukkala et al. as applied to claims 1, 4 and 5 above.

The teachings of Spek in view of Kukkala et al. as applied to claims 1, 4 and 5 are as stated above.

Spek in view of Kukkala et al. does not disclose the use of calcium nitrate, magnesium nitrate, strontium nitrate and barium nitrate or mixture thereof as a coagulant as required by **claim 6**.

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Spek in view of Kukkala et al. does disclose the use of an alkaline earth metal salt of nitric acid, which would be a nitrate of the alkaline earth metals. It would have been obvious to one having ordinary skill in the art to use the alkaline earth metal salts as the coagulant because Spek in view of Kukkala et al. disclose that all alkaline earth metal salts are operable coagulants hence the use of any of the claimed species would have been expected to be operable, especially absent a showing of criticality for using the claimed alkaline earth metals as opposed to the alkaline earth metals which are not claimed.

7. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek in view of Kukkala et al. as applied to claim 1 above in further view of Hoersch (US 2004/0253370).

The teachings of Spek in view of Kukkala et al. as applied to claim 1 are as stated above.

Spek does not teach applying a frothed polymeric dispersion after coagulating the impregnated textile to form a synthetic leather having a poromeric layer thereon as required by **claim 15**.

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Hoersch discloses the use of a frothed aqueous polyurethane dispersion on a textile substrate in order to obtain a synthetic suede leather, which has pleasant appearance, good feel and excellent color stability [0005].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek in view of Kukkala et al. to include the step of applying a frothed aqueous polyurethane dispersion to the impregnated textile. One would have been motivated to do so because both teach processes for impregnating textiles to resemble leather and Hoersch further teaches that using the frothed aqueous polyurethane dispersion results in a synthetic leather which has pleasant appearance, good feel and excellent color stability therefore one would have a reasonable expectation of success in forming the synthetic leather with the benefits described by Hoersch.

Hoersch further discloses that the frothed polymeric dispersion is an aqueous externally stabilized polyurethane dispersion [abstract, 0029-0032] as required by **claim 16**.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spek in view of Kukkala et al and Hoersch as applied to claims 15 and 16 above, and further in view of Shkapenko et al. (US 3598780).

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The teachings of Spek in view of Kukkala et al. and Hoersch as applied to claims 15 and 16 are as stated above.

Spek in view of Kukkala et al. and Hoersch does not teach leaching the synthetic leather in water after drying as required by **claim 17**.

Shkapenko et al. discloses a method for forming a foamed polyurethane that is applied to a substrate and is used to make substituted leather (column 1, lines 30-63). The foamed polyurethane is applied to a substrate such as fabric then is washed with clear water and is dried, after drying the coating is leached with warm water to produce micropores within the film (column 3, lines 9-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Spek in view of Kukkala et al. to include the step of leaching the synthetic leather in water as taught by Shkapenko et al. One would have been motivated to do so because both Spek in view of Kukkala et al. and Hoersch and Shkapenko et al. teach processes for forming synthetic leathers that use foamed polyurethanes and Shkapenko et al. further teaches that leaching the synthetic leather forms micropores which is desired in a poromeric layer therefore one would have a reasonable expectation of success in forming the synthetic leather with a poromeric layer.

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9. Claims 18 – 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek in view of Hoersch.

Spek discloses a method of impregnating a textile substrate with a polymer in order to form synthetic leather.

Spek does not teach applying a frothed aqueous polyurethane dispersion that has an externally stabilizing surfactant to the impregnated textile then heating it to a temperature sufficient to dry and cure the product to form the synthetic leather having a poromeric layer as required by **claim 18**.

Hoersch discloses the use of a foamed aqueous polyurethane dispersion to supply a synthetic leather that has a pleasant appearance and good feel as well as excellent color stability [abstract and 0005]. The foamed aqueous polyurethane dispersion is applied to a textile and is dried and cured [0053-0056].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek to include the step of applying a foamed aqueous polyurethane dispersion of Hoersch. One would have been motivated to do so because both teach process for forming synthetic leathers using nonwoven and woven textiles as well as polyurethane dispersions and Hoersch further discloses that the use of the foamed aqueous polyurethane dispersion results in a

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leather having pleasant appearance, good feel and excellent color stability therefore one would have a reasonable expectation of success in forming the synthetic leather with a poromeric surface.

Hoersch disclose that the frothed aqueous polyurethane can be an aromatic polyisocyanate such as 4,4'-,2,4'- or 2,2'- diisocyanato diphenyl methane [0016] as required by **claims 19 and 20**. The polyurethane dispersion is frothed mechanically [0050] as required by **claim 21**. In regards to **claim 27**, Hoersch does not disclose the addition of an organic solvent in any step in the process therefore it would be obvious to one that it is performed essentially free of organic solvents.

10. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek in view of Hoersch as applied to claim 18 above, and further in view of Goldner et al (US 3169885) and Iwato et al. (US 6649276 B2).

The teachings of Spek in view of Hoersch as applied to claim 18 are as stated above.

Spek in view of Hoersch does not teach leaching the synthetic leather after drying using water essentially free of organic solvents for a time sufficient to remove at least about 10% , 50%, or 70% of the externally stabilizing surfactant as required by **claims 22-24**.

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Goldner et al. discloses a process for forming novel leather substitutes that have hand or feel of leather, breathability of leather, and good tear strength and resistant to tearing (column 1, lines 10-17). The process consist of using a polyesterurethane solution with a surfactant where the breathability and hand of leather is improved by leaching the leather at low temperatures (12-20°C) for 9-16 hours or at higher temperatures (40-60°C) for 10 minutes – 3 hours and after leaching the fabric is dried (column 2, lines 3-35).

Iwato et al. discloses coating a substrate with a aqueous emulsion wherein the emulsion a surfactant is used and results in improved water repellency and heat resistance (column 1, lines 6-11). In the process of Iwato. et al. a substrate is coated with the solution, is then dried and finally after drying is washed with water to remove the remaining surfactant (column 5, lines 18-35).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek in view of Hoersch to include the step of leaching the synthetic leather to remove the surfactant as taught by Goldner et al. and Iwato et al. One would have been motivated to do so because Goldner et al. teaches that the leather will have better breathability and feel by leaching the fabric to remove the surfactant and Iwato et al. further teaches that in order to remove all of the surfactant the leather should be washed with water after drying and Spek in view of

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Hoersch teach a process for forming a synthetic leather with good feel therefore one would have a reasonable expectation of success in forming the synthetic leather.

11. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek in view of Hoersch as applied to claim 18 above, and further in view of Gribble et al. (US 2004/0109992 A1).

The teachings of Spek in view of Hoersch as applied to claim 18 are as stated above.

Spek in view of Hoersch does not teach the use of an externally stabilized surfactant that is a mixture of an anionic and an amphoteric, such as betaine, surfactant as required by **claims 25 and 26**.

Gribble et al. discloses a method for making a frothed aqueous polyurethane foam that can be used on textiles (abstract). Gribble et al. discloses the use of foam frothing and stabilizing surfactants to obtain a lower density foam while still maintaining desired foam properties like abrasion resistance, tensile, tear, and elongation, wet strength, toughness, and adhesion to textile [0028]. Gribble further discloses that desired physical properties of the foam can be obtained by using a combination of anionic and Zwitterionic surfactants, which aids the dispersion stability of the filler

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without negatively affecting the froth and foam stability [0042]. The Zwitterionic surfactant can be N-alkylbetaines [0038].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek in view of Hoersch to include the use of an anionic and Zwitterionic (amphoteric) surfactant in the aqueous dispersion as taught by Gribble et al. One would have been motivated to do so because both teach processes for using a frothed aqueous polyurethane dispersion with textile substrates and Gribble et al. further discloses that using an anionic and amphoteric surfactant in combination results in a foam that has desired physical properties as well as aids the in the dispersion ability of the filler and does not negatively affects froth and foam stability therefore one would have a reasonable expectation of success in forming a stabile frothed aqueous polyurethane dispersion that can be used with textiles.

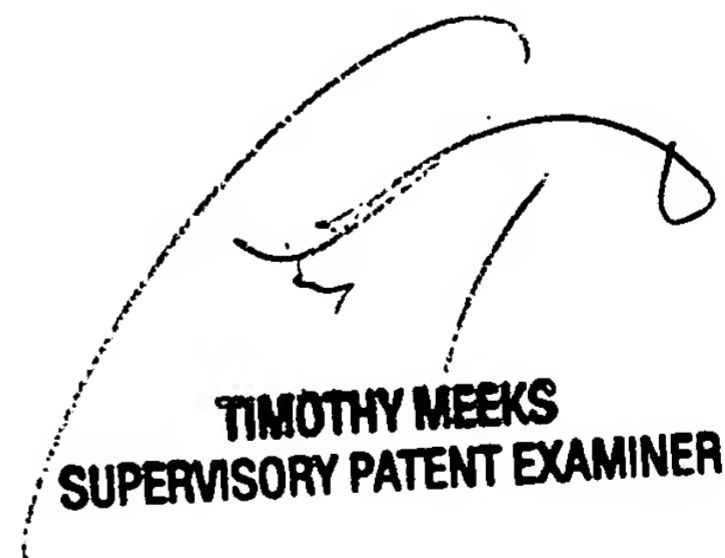
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cachet I. Sellman whose telephone number is 571-272-0691. The examiner can normally be reached on Monday through Friday, 7:00 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Cachet Sellman
Patent Examiner
AU 1762



TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER